

**REMARKS**

By this amendment, claims 19 and 23 have been amended. The specification has been amended to correct certain informalities. Accordingly, claims 1-25 are currently pending in the application, of which claims 1 and 24 are independent claims.

Applicants respectfully submit that the above amendments do not add new matter to the application and are fully supported by the specification.

In view of the above amendments and the following Remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending rejections for the reasons discussed below.

***Rejections Under 35 U.S.C. § 112, second paragraph***

Claims 19 and 23 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Claims 19 and 23 have been amended to clarify that the amounts are “about 40 wt% or less” and “about 30 wt% or less,” respectively. This amendment is made for the sole purpose of clarifying claims 19 and 23. This amendment is not made for the purpose of avoiding prior art or narrowing the claimed invention, and no change in claim scope is intended. Therefore, Applicants do not intend to relinquish any subject matter by these amendments. Applicants respectfully submit that claims 19 and 23, as amended, fully comply with the requirements of 35 U.S.C. § 112, second paragraph.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 112, second paragraph rejection of claims 19 and 23.

***Rejections Under 35 U.S.C. § 103***

Claims 1-7, 9-17, and 19-24 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 5,961,672 issued to Skotheim, *et al.* ("Skotheim") in view of U.S. Patent No. 6,245,458 issued to Sotomura ("Sotomura"). Applicants respectfully traverse these rejections for at least the following reasons.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the reference or references, when combined, must disclose or suggest all of the claim limitations. The motivation to modify the prior art and the reasonable expectation of success must both be found in the prior art and not based upon a patent applicant's disclosure. *See in re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The examiner has failed to establish a *prima facie* case of obviousness. Skotheim discloses a secondary battery including a composite lithium anode and a thin film of lithium ion-conductive polymer interposed between the lithium metal and the electrolyte. However, Skotheim fails to disclose a protective layer including an organosulfur compound, as required by independent claims 1 and 24.

The Examiner relies on lines 1-4 of column 2 of Sotomura for the assertion that "Sotomura discloses an organosulfur protective layer that can be used in a metallic lithium anode" (see the bottom of page 5 of the Office Action). Applicants respectfully disagree. What Sotomura states in that passage is that organic sulfide compounds may be "combined with a metallic lithium anode" in a battery (column 2, line 3). This merely means that both a metallic lithium anode and an organosulfur compound may be included in a battery. The organosulfur compound Sotomura refers to is being used as the cathode of the battery (see column 2, lines

4-8 and 28-32). Therefore, Sotomura does not teach an organosulfur protective layer in a metallic lithium anode.

In fact, Sotomura is directed to a completely different invention than that of Skotheim. Sotomura teaches an electrode composite including an organosulfur compound and a polymer electrolyte (see column 4, line, 15 and column 5, lines 43-58). However, this electrode composite does not include a lithium metal layer, as required by independent claims 1 and 24. Additionally, this electrode composite is used in the cathode electrode, not in the anode electrode (see column 1, lines 10-11 and column 5, line 66-column 6, line 2). Therefore, there is no teaching or suggestion in Sotomura to use an organosulfur compound in a negative electrode.

There is also no motivation for one of ordinary skill in the art faced with the problem presented in Skotheim, to look to the teaching of Sotomura because the references address completely different problems. Skotheim is directed at providing a lithium metal anode that has been stabilized against dendrite formation, whereas Sotomura is directed at providing a cathode electrode composition containing an organic sulfide compound. Even if one of ordinary skill in the art were to combine the teachings of these references, one would not arrive at the claimed invention. Rather, the result would be a lithium battery having the cathode taught by Sotomura and the anode taught by Skotheim. One of ordinary skill in the art would have no motivation to modify the anode of Skotheim based on Sotomura's teachings relating to a cathode.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 103(a) rejection of claims 1 and 24. Claims 2-7, 9-17, and 19-23 depend from claim 1 and are allowable at least for this reason. Since none of the other prior art of record, whether taken alone or in any combination, discloses or suggests all the features of the claimed invention, Applicants respectfully submit that independent claims 1 and 24, and all the claims that depend therefrom, are allowable.

Claims 8 and 18 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Skotheim in view of Sotomura, in further view of Japanese Publication No. 10-101793 to Zuiho, *et al.* Applicants respectfully traverse this rejection for at least the following reasons.

Applicants respectfully submit that claim 1 is allowable over Skotheim and Sotomura, and Zuiho fails to cure the deficiencies of Skotheim and Sotomura noted above with regard to claim 1. Hence, claims 8 and 18 are allowable at least because they depend from an allowable claim 1.

Claims 24 and 25 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Skotheim in view of Sotomura, in further view of U.S. Patent 5,523,179 issued to Chu ("Chu") and U.S. Patent 6,030,719 issued to Fauteux *et al.* ("Fauteux"). Applicants respectfully traverse these rejections for at least the following reasons.

Chu and Fauteux fail to cure the deficiencies of Skotheim and Sotomura. It is noted that while Chu discloses an active-sulfur material in a positive electrode, Chu provides no such teaching regarding a negative electrode. The Examiner cited Fauteux for the teaching that an anode and cathode become interchangeable with each other depending on whether the cell is charging or discharging. However, even if the negative electrode of Chu, which comprises a lithium metal layer, becomes the positive electrode, and the positive electrode of Chu, which comprises the active-sulfur material, becomes the negative electrode, one does not arrive at the claimed invention. Rather, in this scenario, the negative electrode comprises an active-sulfur material, but not a lithium metal layer. Therefore, none of the references teach an electrode including both an organosulfur material and a lithium metal layer, as required by independent claim 24.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 103(a) rejection of claim 24. Claim 25 depends from claim 24 and is allowable at least for this reason.

Since none of the other prior art of record, whether taken alone or in any combination, discloses or suggests all the features of the claimed invention, Applicants respectfully submit that independent claim 24, and the claim that depends therefrom, are allowable.

***Other Matters***

In addition to the amendments mentioned above, various paragraphs of the specification have been amended solely for the purposes of informality correction, better wording and clarification. These amendments are not made for the purpose of avoiding prior art or narrowing the claimed invention, and no change in claim scope is intended. Therefore, Applicants do not intend to relinquish any subject matter by these amendments.

**CONCLUSION**

Applicants believe that a full and complete response has been made to the pending Office Action and respectfully submit that all of the stated grounds for rejection have been overcome or rendered moot. Accordingly, Applicants respectfully submit that all pending claims are allowable and that the application is in condition for allowance.

Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative at the number below to expedite prosecution.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,

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